

Writing the Research Proposal

Research is never a solo flight—an individual excursion.

It begins by researchers communicating their thoughts,

Their plans, their methods, their objectives

For others to read, to discuss, to act upon.

The overture opening such a research dialogue is the research proposal.

As a point of departure, it must be a precision instrument

From the first word to the last.



Research is never a solo flight. It is an activity that involves many people and presumes the accession to and the use of resources far beyond one's personal possessions. For that reason, research is not some "do-it-in-a-corner" activity. It must be aired, laid out, inspected, and, in nearly every instance, approved by others.

The graduate student must get the approval of an academic committee. A researcher seeking a grant must get approval from the university or the organization for which he or she works, and the project must merit the approval of the grant-awarding agency. These approvals are usually secured through the submission to proper authorities of a document known as a *research proposal*. The proposal discusses openly the problem for research, exactly how the research will be executed, and spells out in precise detail the resources—both personal and instrumental—that the researcher has available for producing the proposed results.

Researcher and Architect: Planners In Common!

Researcher and architect—two individuals for whom planning is the essence of their art. Essentially, they have the same orientation. The architect plans structural concepts for physical buildings. The researcher plans structural concepts for the solution of problems. With both, structure, conceptualization, practical methodology, and up-front planning are basic requirements.

A proposal is as essential to successful research as an architect's drawing is to the construction of a building. No one would start building a structure by rushing out to dig a hole in the ground for the foundation without knowing in detail how the house will look when finished. Before one turns a shovelful of earth, many questions must be answered, many decisions made. What kind of building do you propose to construct? A dwelling? Will it be a two-story, a split level, or a ranch type? How

will the house be placed on the building lot? Where will the openings be located? What kind of roof will it have? What will be its pitch? What kind of heat will it have? Where will the electrical outlets and switches be placed? We could go on and on. Every one of these questions is extremely important, and each must be answered specifically *before* a pound of dirt can be excavated or a nail driven.

Even then, after you have made all these decisions, do you immediately begin digging? Not at all! Yet another preliminary phase remains. The architect now draws a plan of the entire structure, floor by floor, showing to the fraction of an inch precisely where every detail will be located. Insofar as possible, nothing is left to chance.

Now, you think, everything is ready; you may stake off the position of the building and start to dig for the foundation. Not so fast! Before you do anything you need permission. The contractor must get a building permit, since many communities have building restrictions and building codes. You must observe all of these ordinances—setting the building back the required distance from the street, structure clearances from the property line, and on and on. The point is: Permission is indigenous to the plan. This principle holds in constructing a building and in doing research.

Like the architect, who presents a concept of the building by means of plans and elevations, the researcher presents a concept of the proposed research project investigating the viability of such an undertaking and presenting the plans for it in a written research proposal. In the proposal, the problem and its attendant subproblems are stated clearly, all necessary terms are defined, the delimitations are carefully stated, the hypotheses articulated, and the importance of the study practically and succinctly spelled out. The researcher then spells out every detail of acquiring, arranging, processing, and interpreting the data.

The architect's work is not complete with the executing of the floor plans. The architect then draws a series of elevations of the proposed building, showing each side to scale as it will appear when completed. Finally, the architect will draw up a set of specifications for the building indicating exactly what lumber is to be used, how far apart certain members are to be placed, the sizes and types of windows and doors, and all other details. Nothing is left unspecified.

The researcher does likewise. Parallel to the architect's elevations, the researcher produces an Outline of the Proposed Study. Parallel to the specifications, the researcher sets forth the resources at hand for doing the research: his or her own qualifications (and those of his or her staff, if any); the availability of the data; the means by which they will be secured; computer facilities, if these are needed; and any other aspects of the total research process that merit explanation. Nothing is overlooked: All questions that may arise in the minds of those who review the proposal are anticipated and answered. Any unresolved matter is a weakness in the proposal and may seriously affect its approval. The importance of the proposal cannot be overemphasized. It is frequently the magic key that will unlock for the researcher the door that gives free access to the research endeavor. Conversely, if it is not clearly and explicitly delineated, it may cause the whole project to be turned down.

Some students—and others seeking research grants—seem to think that the proposal is merely a necessary formality and do not give it the serious consideration it deserves. They try in a few pages to set forth the project. It usually fails. Those sponsoring a project, whether a graduate committee or a funding agency, realize that in doing research there is too much money, time, and effort invested to rush into it without a clearly conceived goal, a practical assessment, and an objective and detached evaluation of all aspects of the research endeavor.

Whether you seek funding of a project from a grant foundation or whether you seek to show your professor or your graduate committee that you have the ability to plan and carry out an investigation independently, a clear, well-written proposal is indispensable. Nothing is a substitute for an explicit setting forth of both problem and procedure. Other names for a proposal are prospectus, plan, outline, statement, and draft. If you are asked to present any of these, you are asked to present a research proposal.

Characteristics of a Proposal

Research demands that those who undertake it be able to think clearly, without confusion. The proposal will demonstrate, fortunately or unfortunately, whether you possess that quality. When one reads a proposal that is poorly organized, filled with extraneous details, and foggily focused, one gets the immediate impression that the mind that produced such a mélange of confusion can never be disciplined to regard facts objectively and construe them logically. Unwelcome as the fact may be, your qualification as a researcher more often than not rests squarely upon the quality of the proposal you submit.

Therefore, you should appreciate exactly what characteristics a proposal should have.

• A proposal is a straightforward document. It should not be cluttered with extraneous matter. It begins without introduction with a straightforward statement of the problem to be researched. It stands upon its own feet; it needs no explanatory props — no introduction, prologue, or statement of reasons why the researcher became interested in the problem or feels a burning need to research it. That may be interesting, but none of it is necessary or appropriate. Those who will review your proposal are not interested in such autobiographical excursions. These, indeed, suggest that you cannot separate essentials from irrelevancies; and that, unfortunately, will neither enhance your stature as a researcher nor recommend you as one who can think without irrelevancy and digression. *How much direct should be direct?* Whatever does not contribute directly to the delineation of the problem and its solution must be eliminated. Anything else only obscures and is diversionary. Remember the architect's drawing: clean, clear, and economical. It contains all that is necessary; not one detail more. *He is giving hard feedback!*

Journalists are taught — or if not taught, soon learn — that the first words they write are the important ones. You capture or lose your reader with the first sentence. It is impossible to overemphasize the importance of the beginning — whether of a speech, a news story, an article, or a proposal. *He is quantitative!*

A proposal begins with these words: "Four decades ago the social and economic status of minority groups in the United States were. . . ." The normal reaction of the reader of such a proposal might readily be: "Who cares, at this moment, what the social and economic status of minorities were forty years ago? What we want to know is not history but prophecy. What does the researcher propose to do now? C'mon, what's the problem? State it!" *→ A bit too hard, but apparently very much right.*

You see, your first sentence has irritated your reader, put you immediately at a disadvantage, and perhaps sacrificed your reader's interest; more seriously, it has indicated that you cannot distinguish between history and future planning and so casts umbrage upon your ability as a researcher to think clearly and critically.

In fact, such a beginning might even suggest that the writer does not actually know the meaning of *proposal*, which is a serious indictment, indeed. This is a word that looks forward, to what the researcher plans to do in the future. It is a document that employs the future tense of the verb. If the writer intended to make an analytical comparison of the social and economic conditions of two groups, he or she should have forthrightly begun: "This study will analyze the social and economic status of certain specific minority groups today with their similar status four decades ago for the purpose of. . . ."

This is a no-nonsense beginning, and it indicates that the writer knows what a proposal should be.

• A proposal is not a literary production. An architect's drawing is not a work of art; a proposal is not a "literary" (in the sense of being consciously a piece of fine writing) production. The mission of neither is to be artistic; the purpose of both is to communicate clearly. As an architect's drawings present an idea of construction with economy of line and precision of measurement, so a proposal indicates how a research project is to be executed to completion, with an economy of words and a precision of expression. It provides no opportunity for fine writing, for literary composition, for verbal extravagance. Quite the contrary, stylistically it is generally stark and prosaic.

The language must be clear, precise, and sharp. The proposal provides a chance to show with what

ultimate clarity and precision the researcher can state a problem, delineate the treatment of the data, and establish the logical validity of a conclusion.

To those who have been nurtured in the idea that writing should be stylistically interesting and artistically creative, the preceding statements may come as a distinct shock. But to write a superb proposal calls for skills of expression quite as demanding as those needed for the forging of an unforgettable sentence.

• A proposal is clearly organized. Proposals are written in conventional prose style, and thoughts are expressed in simple paragraph form. The organization of the thought—the outline, as it were—is indicated by the proper use of heading and subheading. The use of the indented outline is neither conventional nor acceptable in the presentation of formal proposals. Those who employ the indented outline form may lay themselves open to criticism on two counts: They may be suspected of never having learned how to express the outline of their thought by the use of headings and subheadings; but more seriously, outlines hint at brevity, brevity hints at superficiality, superficiality suggests a most undesirable quality on the part of the researcher. Such may, of course, not be so; but no proposal should ever result in its author being represented in an unfavorable light.

Nevertheless, organization and outline are absolutely essential. They hint at an orderly and disciplined mind—one of the highest tributes to a researcher's qualifications. If you are not conversant with the use of headings to indicate thought organization, refer to the section of Chapter 11 titled, "Headings Show Organization" (pages 237–238). There you will find a working knowledge of the basics of this stylistic convention. Efficient readers recognize immediately the outline organization of the thought when expressed with appropriate headings.

There is a rule of thumb, that may assist you in reading, as well as writing, headings and recognizing their relative importance.

1. The most important headings are in ALL CAPITAL LETTERS and centered upon the page. These are headings of the largest units of writing. Chapter headings are thus designated in typescript (corresponding to Roman numerals I, II, III, etc., in an outline).
2. Headings in ALL CAPITAL LETTERS flush with the left margin and separated from the text (freestanding sideheads—that is, sideheads separated from the text above by two spaces and from the text following by a single space) are in second order of importance (corresponding to the capital letters A, B, C, etc., in an outline).
3. Headings in capital and lowercase letters, which are freestanding, are of the next lower order of subheadings (corresponding to the 1, 2, 3, etc., level in an outline). In typescript, underlining means to italicize. This heading is followed by a period. Other headings have no mark of punctuation following them.
4. Paragraph sideheads are headings inserted into the opening of a paragraph. The first word is printed with a capital letter and the rest of the words begin with lowercase letters. All are in italic. These correspond to the a, b, c, etc., level in an outline.
5. Seldom encountered is the least important heading of all. It is a centered heading with the first word capitalized and not underlined. It corresponds to the 1', 2', 3', etc., level in an outline.

Turn back, now, to Chapter 4, The Review of the Related Literature. Notice only the headings in that chapter. They indicate four levels of outline subdivision and the thought organization of the chapter.

The major organizational category is indicated by the wording of the first line: "IV. The Review of the Related Literature." This, then, is marked IV to indicate that it is the fourth major division of the entire book: the chapter. This is part of the organizational plan from the viewpoint of the book as a whole. Now under this main heading the remainder of the chapter is outlined.

Here in structural outline form is the organization of Chapter 4 as indicated by the heading and subheadings:

(...)



Oh, dear!...
Que grande bagagem!
E nos temos que
nos informar a isto!
(isto não é design!)

IV. The Review of the Related Literature

A. Understanding the role of the review

1. The purpose of the review
2. How to begin a search for related literature
 - a. Go to the indexes and abstracts
 - b. Data base access to the literature
 - c. The treasury of government publications
 - d. Go to the library armed with data-gathering tools
 - e. Make as many copies of the bibliographic item as necessary
 - f. Be systematic and thorough
 - g. Relate your bibliography to your problem
3. How to write the section on the related literature
 - a. Get the proper psychological orientation
 - b. Have a plan
 - c. Emphasize relatedness
 - d. Review the literature; don't reproduce it!
4. Showing relatedness of the literature to the research project

B. Points of departure

1. Abstracts
2. Indexes

[Practical application]*

[Special features of the chapter]*

1. Significant and influential research
2. The computer as a tool of research

C. For further reading

Were you aware when you read that chapter that that was the outline of it? You should have been, and you should impart the outline of your thought to your readers in the same way. It is the professional way in which thought organization is expressed. Examine your textbooks—even current magazine articles—and you will find how prevalent the outline structure expressed by headings really is.

→ in this sloppy system. — he says —

There are much better ways of accomplishing so! in this crazy way?

Content and Organization of a Proposal

Proposals follow a simple, logical form of presentation. Although there are many ways to arrange the items within the proposal, the following is the outline of the proposal that we will follow in this text. A sample proposal for a research project is presented in Appendix A, and the significant features of the proposal are commented upon in the right-hand column. Refer to it.

I. The problem and its setting

- A. The statement of the problem
- B. The statement of the subproblems
- C. The hypotheses (→ Quantitativos apinas)
- D. The delimitations
- E. The definitions of terms

*These headings are placed in brackets to indicate that, while the first two do not appear on the face of the chapter, they are actually separate sections of each chapter given to a discussion of continuing topics: (1) Significant and Influential Research, and (2) The Computer as a Tool of Research. The Practical Application section was similarly treated because it has no integrational relationship to the thought organization of the chapter.

→ The introduction is well!

- ✓ F. The assumptions
- ✓ G. The importance of the study
- ✓ II. The review of the related literature
- ✓ III. The data, their treatment, and their interpretation
 - ✗ A. The data
 - 1. The primary data
 - 2. The secondary data
 - ✗ B. The criteria governing the admissibility of the data
 - ✓ C. The research methodology
 - ✓ D. The specific projected treatment of each subproblem
 - 1. Subproblem 1 (The subproblem is here restated)
 - ⊗ a. Data needed
 - ⊗ b. Where the data are located
 - ⊗ c. How the data will be secured
 - ⊗ d. How the data will be treated and interpreted
 - 2. Subproblem 2 (Here, again, the subproblem will be restated and the four steps: a, b, c, and d are detailed. Then each succeeding subproblem will be given similar treatment.)
- ✓ IV. The qualifications of the researcher (and the qualifications of each one of the researcher's staff if more than the researcher is involved in the project)
- ✓ V. The outline of the proposed study
- ✓ VI. A selected bibliography

One rule governs the writing of proposals and final documents: *The arrangement of the material should be so presented that it forms for the reader of the document a clear progressive presentation by keeping items together that belong together* (such as the problem and its resultant subproblems; the subproblems and their corresponding hypotheses).

In suggesting ways to write a convincing proposal, Dr. Lois DeBakey gives some valued directives.¹

Write the first draft [of the proposal] with attention exclusively to orderly sequence and without consideration for grammatical or rhetorical perfection. Stopping to examine each work phrase, or clause will shift your attention from thought to form and will interrupt the rational flow of ideas. You can always refine your compositions later, but if the presentation of your ideas is disorderly, major excision and reconstruction will be required to repair the damage. Use succinct language; and assign to appendices any auxiliary information, to prevent cluttering the text with excessive detail.

INTRODUCTION

In any unit of exposition, be it a sentence, a paragraph, or a full composition, two of the most important positions are the first and the last. The introduction, therefore, should be prepared with special care, for if you fail to engage the reviewer's interest in the beginning, you may lose it altogether. . . .

State the problem and the aims clearly and promptly, rather than make the reader transverse several pages before he finds out what your central point is. . . . Emphasize what is unique about the project. . . .

Your opening paragraph should inspire confidence and convince the reader that what you wish to do warrants careful consideration. *Remember that cold print alone must sell your idea.*

MATERIALS AND METHODS

The introduction should lead naturally and smoothly to the section on methods, which is probably the most carefully examined section of the [proposal] and, therefore, one of the most important. . . .

Describe clearly the method of selection of subjects or materials and the provision of controls for variables that might later be confused with experimental effect. To defend your choice of procedure, you must obviously be familiar with the capabilities and limitations of all available methods. . . .

¹Lois DeBakey, "The Persuasive Proposal," *Journal of Technical Writing and Communication*, 6:1 (1976), pp. 5-25.

Be sure that your experimental design is rational, ethical, and defensible and that it can yield answers to your stated problem. . . .

Never assume that the reader knows anything of vital significance that you have omitted from your presentation. Even if he knows it, he will not know that *you* know it too unless you tell him. Make certain that you have at least described the sample, the experimental design and procedure, the method of collection and analysis of data.

EXPECTED RESULTS

Following the section on methods is that on expected results, which should be written honestly and objectively. Overstated claims . . . should be avoided in favor of sober statements based on logic and reason. Try to estimate the potential generality of the results and the basis for your judgment. When tables and graphs summarize data for this section more efficiently than text, they may be used to advantage. Any tests, instruments, publications, films, or other educational material that may be by-products of the project should be noted.

DISCUSSION

In the Discussion, you have an opportunity to show your broad familiarity with the various aspects and implications of the problem and to present the potential significance of the prospective results. Be sure to indicate any distinctive qualities of this research as compared with previous studies. Wild speculation is anathema. This is the place to persuade your reader that your proposed study holds real promise. . . . And you may wish to suggest new directions for subsequent or concurrent projects in related research.

REVISION !!

When you have completed the first draft, lay it aside for a couple of weeks or so — long enough to be able to read it with detachment and objectivity. If you re-read it too soon, you may read what you *thought* you wrote, not what you actually put down on paper. Read first for logical order and coherence, accuracy, clarity of purpose, unity of thesis, and consistency; then for grammatical integrity, punctuation, grace of expression, and mellifluousness. Note, too, whether the narrative flows smoothly and logically from one statement to the next and from one paragraph to the next. Reading aloud will uncover defective rhythm or cadence, as well as improper balance and emphasis.

If I had to identify the most important literary requisite for [a proposal], I would choose precision — precision in choice of words and their arrangement to convey the intended meaning.

CONCLUSION

The applicant should remember that the proposal is a kind of promissory note. It is a mistake to promise mountains and deliver molehills, because the day of reckoning will come — when you will have to write a formal report of your research project. It is through writing, therefore, that both the need for the research and the importance of the results are communicated, and the investigator with literary prowess has a distinct advantage in achieving both of these objectives.

Success Begins with the Initial Proposal

It is a frustrating experience for a researcher to have gone through all the activity of gathering data and processing them and then to have a graduate committee turn down the effort because the data have not been interpreted, the hypotheses have not been resolved, or any one of many reasons such committees may give for not approving the student's efforts.

Success begins long before the tumult of activity begins. All research begins with a proposal. The proposal is a clear statement of the problem and subproblems, the data and how these will be processed; and, most important of all, how they will be interpreted. It is at this critical juncture where most students fail to make the nexus that takes the research out of a mere activity and transfers it to a research endeavor.

In planning research, in preparing the proposal, or in writing the research report, researchers come to the point where it is necessary to answer the question, how will the data be interpreted? Here is where the success of the research effort hangs upon a thread.

Let us take a typical situation to see how many students attempt to answer that most important of

all questions. We will take a page from one student's proposal. It attempts to spell out how the student will interpret the data for the purpose of resolving a subproblem in a dissertation in economics dealing with labor relations. The general problem was to "analyze the attitudes of professional employees toward certain aspects of management policy and to evaluate the relationship between these attitudes and the responsibility of management to articulate such policy for its employees."

The student is spelling out the manner in which he expects to resolve a particular subproblem. The subproblem is, What does an analysis of the attitudes of employees toward management policy for salary increases and merit pay reveal? A page from the student's proposal, indicating how he intended to resolve this question is shown.

TREATMENT OF EACH SPECIFIC SUBPROBLEM

Restatement of Subproblem 1. The first subproblem is to determine through an analysis of employee responses the attitudes of employees toward certain aspects of management policy for salary increases and merit pay.

The Data Needed

The data needed to resolve this subproblem are those employee responses to questions concerning salary increases and merit pay.

Where the Data Are Located

The data are located in the employee responses to questions 3, 7, and 13 of the questionnaire, "Survey of Employee Attitudes Toward Management."

How the Data Will Be Secured

The data will be secured by accurately tabulating all of the responses of employees to the above questions on the questionnaire.

How the Data Will Be Interpreted

From the responses of the questions a table will be constructed similar to the following structural model. It will indicate the employee attitudes, their frequency, and the percentages of these attitudes of the total attitude response to each question.

Attitude	Frequency	Percentage
Totals		

A graph will then be constructed to show which attitudes have received the greatest number of reactions and those which have had the least number of reactions. The median and the mean will also be found for the total group as a basis for comparison.

Now, let us look at that page. First, consider the wording of the subproblem:

The first subproblem is to determine *through an analysis of employee responses* the attitudes of employees toward certain aspects of management policy for salary increases and merit pay.

Now read the section "How the Data Will Be Interpreted." What has the researcher really done? Has he *interpreted* (shown what the data mean) any of the data? Has he "determined" anything *through an analysis of employee responses*?

No! He has merely *tabulated* and *graphed* the data. He has rearranged them and presented them in another form. The data remain raw, as they were originally in the questionnaire. Finally, the researcher informs us that he *intends to find two points of central tendency* for the data—the median and the mean. Why? What do these tell us about "attitudes of employees toward certain aspects of management policy"? Median and mean of what? The frequencies or percentages? Which? And for what purpose? What will these measures tell us about the "attitudes of employees"? What is the rationale for the statistical operation? These are primary questions that should be answered in the proposal as well as in the student's own mind.

If, at this juncture, the researcher returns to the subproblem and reads it carefully, the fact should be immediately apparent that what has been suggested will never produce an *analysis* of employee responses, but merely an amassing, a tabulating, a conversion, a statistical manipulation of employee responses into another form. Granted, the proposal may be the first step in preparing the data for analysis, but if the researcher does what he says he intends to do, no analysis will be effected.

If after codifying the data, the researcher had then considered them *analytically*, he would have resolved the responses into various gradational categories, would have classified the responses into those supportive of and those opposed to managerial policies. He would have carefully reviewed each of the categories to discern the characteristics of each. Were those who supported management lukewarm in their support? What key words were used in their responses? What did the overall category response indicate about the group psychology behind the *attitudes of the employees* (Read the subproblem!)? What the student intended to do as expressed by the excerpt from the proposal would never have resulted in any indication of employee *attitude*.

Guidelines with Respect to Interpretation of the Data

We have said enough about the example. But from the foregoing discussion, some basic guidelines for handling the data may be helpful.

• *Be systematic in describing the treatment of the data.* In the proposal especially, indicate a logical sequence of the steps necessary to solve *each* subproblem *separately*. Refer to Appendix A. Note how the author of the proposal there presented has taken each subproblem and clearly presented four steps in the resolution of it: what data were needed, where these data were located, how these data would be secured. Many students know where the data are, but they have no idea how they will gain access to them or, most importantly, how the data will be interpreted. Perhaps you would do well to repeat the subproblem immediately before explaining how the data will be interpreted. This restatement will keep uppermost in the researcher's mind precisely what the subproblem is aiming to achieve. Then read the subproblem carefully. Are there critically important "key" words: "to determine through employee responses the attitudes of employees"?

→ a. • *State clearly the data you need to resolve the subproblem.* Under a heading, "The Data Needed," indicate specifically the data you will need for the resolution of the subproblem being investigated. Do not engage in generalities. The sample page just presented was excellent with respect to specifying the precise data needed. It indicated that the researcher needed responses to questions 3, 7, and 13 of the questionnaire.

→ b. • *State precisely where the data are located.* With respect to the sample page presented, this section was largely a repetition of the preceding statement. Nothing is wrong with this. In research,

it is better to repeat than to leave a hiatus that raises unresolved questions in the mind of the consumer of your research.

In some studies, however, where a student may need a certain kind of records—and this is particularly true with respect to historical research—the student should know the exact location of these records. Too many students begin research projects assuming that records are available only to learn too late that either no records exist or that, if they do exist, they are in an inaccessible location or under such heavy restriction that they are not available. Facing the question, “Where are the data located?” frankly, and answering such a question in writing by giving a definite location for such records, may clear the air at the beginning of one’s research effort.

c. • State without equivocation how the data will be secured. Again, with the sample page given above, little difficulty is presented at this point. The student already had the data! But suppose the data are letters of a famous person in possession of that person’s family. You may know where the letters are located; the next question is, how do you intend to get them for your research purposes? Perhaps in cases like this—or with any records under the control of others—the name and address should be given of the individual who possesses the data. A statement should be included to the effect that this custodian of the data has consented to your using them for research purposes. This should be clearly stated in the proposal so that your sponsor, your academic committee, the funding agency, or whoever may be interested in reading your proposal before the research is begun can see clearly that you have provided for all contingencies against failure to secure the data, which is common with many students, who dream great dreams and upon the airy substance of them alone undertake research projects without sufficient preliminary groundwork.

d. • State fully and unequivocally how you intend to interpret the data. This is often the weakest link in any research endeavor. It is also the most difficult aspect of any research project. Truth, hope, faith are all fine in their place; but they cannot substitute for clear thinking and hardheaded planning.

Some purported researchers skirt this requirement by the subterfuge of employing vague and generalized language—so vague, so generalized that their statements are worthless from a practical research planning and design standpoint. A basic test for the adequacy of your statement of the treatment of the data is the following: The plan for the treatment of the data should be so unequivocal and so specific that any other qualified person seeing only your proposal could carry out your research project without benefit of your presence and by means of your proposal alone.

Every contingency should be anticipated; every methodological problem should be resolved. The degree to which you delineate how the data will be interpreted will augur the success or failure of your research endeavor. It is the key to research success, and it should be presented with utmost care and precision.

• Every step in the interpretation of the data should be fully spelled out. Too many students assume this is unnecessary. They prefer to cut corners. They assume that others know what they mean, and so they avoid taking the trouble to express it. All these assumptions are false. Too many students attempt to do in a tenth of a page what they should take ten pages to do. We may add that those who apply for funding for their projects frequently suffer from the same deficiency.

Spelling out the treatment and the interpretation of the data is a tedious, time-consuming process. Attempting to relegate it to the broad sweep, the quick and easy statement, the careless approach almost invariably courts disaster. Certain procedural guidelines may, therefore, be given.

1. Ask yourself continually just what it is that you are doing. Research is euphoric. Make a clear distinction between arraying the data and interpreting the data. Tables, charts, graphs, maps—all these contrivances—are merely ways of arraying the data. The process is repackaging. All these intermediate modalities for data may be highly important to their ultimate interpretation. This is not to disparage or discredit their function; it is merely to see without confusion clearly.

2. *Insist that your statistics have a defensible rationale.* It is pointless to tell us you will derive the mean and/or standard deviation and stop there. Why do you need these statistical values? How will they help you derive meaning from the data? Is this statistical manipulation of the data indispensable to the understanding of it? What are your formulas? Why did you choose these formulas? Where did you get them? (Footnote your source, and give the symbol equivalents.)
3. *At what specific point does the manipulation of the data cease and your own thinking begin?* There is a point in every project where fumbling with the facts ceases and research begins. Unless you can indicate the precise point where you assume control of the data—where the ministrations of computers, graphics, tabulations, and so forth cease—and unless you can describe what role you will play in processing the data, you should be very circumspect in calling whatever you have done *interpretation* of the data. Only the genius of human insight can cause dead facts to speak. There is no other way.

• *The research process is cyclical.* That the entire research process is cyclical was one of the basic propositions with which this book began. Because we have been considering a subunit of the total research design—namely, the treatment of the data with respect to a subproblem—we find that the principle of circularity applies here as well as it does with the overall design. The difference is, however, that here it is only a shrunken orbit of the great circular process.

To test the circularity and, likewise, the validity of your research design use the “If-Test” technique. It goes like this:

The If-Test Technique

- 
1. The point of beginning is the subproblem. State it completely. Then answer the following seven questions.
 2. If I have this subproblem, what data do I need to resolve it?
 3. If I need these data, where are they located?
 4. If they are located there, how can I obtain them?
 5. If I can obtain them, what do I intend to do with them?
 6. If I do that with the data, will the result of doing it resolve my subproblem?
 7. If my subproblem is resolved, then what hypothesis was I testing based on that subproblem?
 8. If that was my hypothesis, what do the facts show with respect to the support or rejection of it?
 9. If my hypothesis is supported, I hypothesized correctly.
 10. If my hypothesis is not supported, then I have discovered something that I did not expect to be so.
- Only in quantitative studies!

• *Be sure the data support your conclusions.* Unfounded enthusiasm is one of the hazards you will need to guard against. One mark of immature researchers is that, bewildered by the many data they must handle or dazzled by a newly emerging concept, they make extravagant claims or reach enthusiastic conclusions that are not warranted by the data. Research is indeed an exciting quest, but researchers must learn—particularly those doing a descriptive survey study—that though their data frequently lie close to the vibrant pulse of life, they cannot permit this to influence the objective judgment of their message. Archimedes is perfectly justified running through the streets of Athens screaming, “I have found it” after he is sure that he has found it. Only after the Athenian bathtub ran over did he reach his conclusion. Much research contains unfounded conclusions unsupported by the data and based upon shaky statistical procedures or unwarranted extrapolation of the facts. Research should rest solidly and completely upon its own factual foundation.

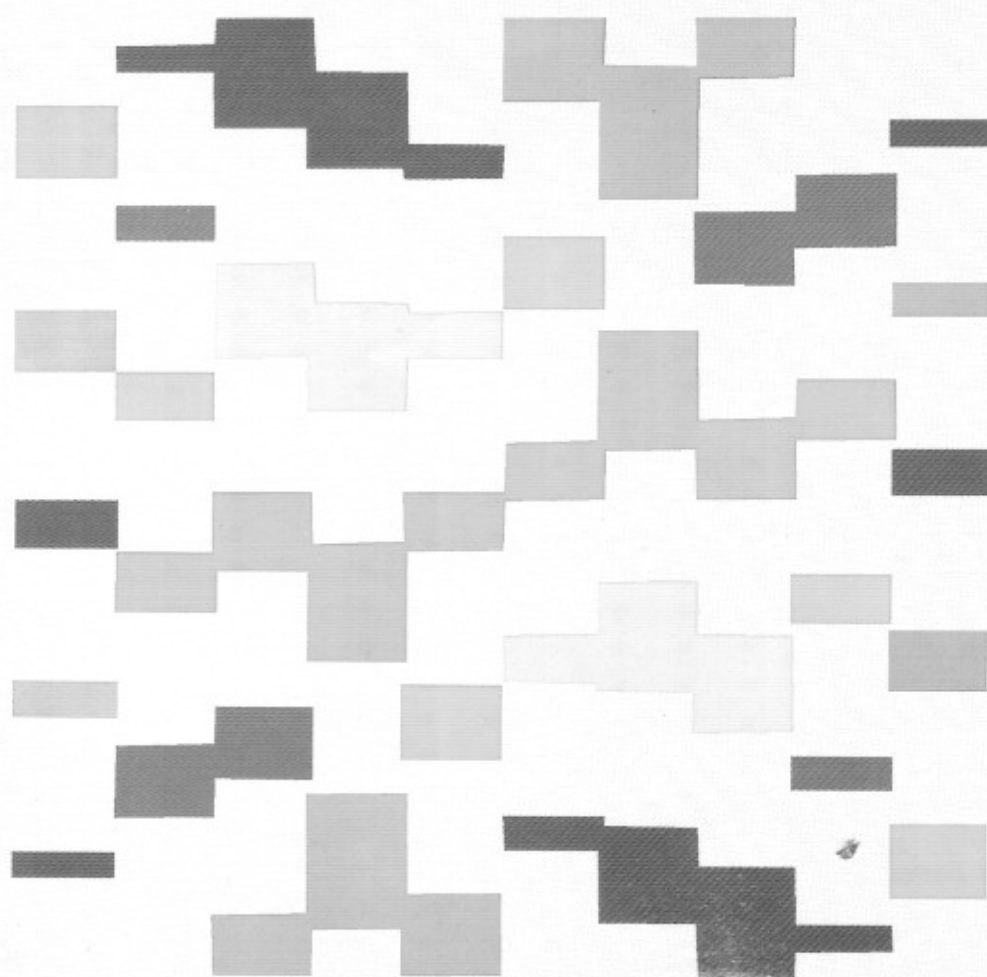
Look the facts steadfastly in the face. Report honestly what those facts reveal to you. That is good research.

PAUL D. LEEDY

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